

## CLAIMS

We claim:

1. An apparatus for selectively exchanging light energy between a plurality of optical fibers, comprising:

a first optical fiber;

a second optical fiber;

a first mechanism adapted to selectively toggle at least a portion of said first optical fiber between a first orientation relative to said second optical fiber and a second orientation relative to said second optical fiber; and

a second mechanism adapted to selectively and adjustably impart a bend to a first portion of said first optical fiber.

2. The apparatus of claim 1 further comprising:

a third optical fiber; and

a third mechanism adapted to selectively and adjustably impart a bend to a second portion of said first optical fiber;

said first mechanism further adapted to selectively toggle at least a portion of said first optical fiber between a first orientation relative to said third optical fiber and a second orientation relative to said third optical fiber.

3. An apparatus for selectively exchanging light energy between a first optical fiber, a second optical fiber, and a third optical fiber, comprising:

means for positioning said first optical fiber and said second optical fiber in a predetermined orientation relative to each other;

means for selectively toggling said third optical fiber between a first orientation relative to said first and second optical fibers and a second orientation relative to said first and second optical fibers;

means for selectively effecting a bend in a first portion of said third optical fiber when said third optical fiber is in said first orientation relative to said first and second optical fibers; and

means for selectively effecting a bend in a second portion of said third optical fiber when said third optical fiber is in said first orientation relative to said first and second optical fibers.

4. The apparatus of claim 3 wherein at least one of said first and second optical fibers further comprises a lens.
5. The apparatus of claim 3 wherein light energy can be selectively exchanged between said first and third optical fibers when said third optical fiber is in said first orientation relative to said first and second optical fibers.
6. The apparatus of claim 3 wherein light energy cannot be exchanged between said first and third optical fibers when said third optical fiber is in said second orientation relative to said first and second optical fibers.

7. The apparatus of claim 3 wherein light energy can be selectively exchanged between said second and third optical fibers when said third optical fiber is in said first orientation relative to said first and second optical fibers.

8. The apparatus of claim 3 wherein light energy cannot be exchanged between said first and third optical fibers when said third optical fiber is in said second orientation relative to said first and second optical fibers.

9. An apparatus for selectively exchanging light energy between a first optical fiber, a second optical fiber, and a third optical fiber, comprising:

a substrate, said first optical fiber and said second optical fiber positioned on said substrate in a predetermined orientation;

an adjustable clamp configured to selectively toggle said third optical fiber between a first orientation relative to said first and second optical fibers and a second orientation relative to said first and second optical fibers;

a first coupling adjustor selectively and adjustably imparting a bend to a first portion of said third optical fiber when said third optical fiber is positioned in said first orientation relative to said first and second optical fibers; and

a second coupling adjustor selectively and adjustably imparting a bend to a second portion of said third optical fiber when said third optical fiber is positioned in said first orientation relative to said first and second optical fibers.

10. The apparatus of claim 9 wherein light energy can be selectively exchanged between said first and third optical fibers when said third optical fiber is in said first orientation relative to said first and second optical fibers.

11. The apparatus of claim 9 wherein light energy cannot be exchanged between said first and third optical fibers when said third optical fiber is in said second orientation relative to said first and second optical fibers.

12. The apparatus of claim 9 wherein light energy can be selectively exchanged between said second and third optical fibers when said third optical fiber is in said first orientation relative to said first and second optical fibers.

13. The apparatus of claim 9 wherein light energy cannot be exchanged between said first and third optical fibers when said third optical fiber is in said second orientation relative to said first and second optical fibers.

14. The apparatus of claim 9 wherein said substrate comprises at least one groove and wherein at least one of said first and second optical fibers is positioned in said at least one groove.

15. The apparatus of claim 9 wherein said first coupling adjustor comprises a groove and wherein said first optical fiber is positioned in said groove.

16. The apparatus of claim 9 wherein said first optical fiber is configured to direct light at said bend imparted to said first portion of said third optical fiber.

17. The apparatus of claim 16 wherein said first optical fiber further comprises a lens, said lens being configured to focus light at said bend imparted to said first portion of said third optical fiber.

18. A method for selectively exchanging light energy between a plurality of optical fibers, comprising the steps of:

placing a first optical fiber in a first predetermined spatial relationship with respect to a second optical fiber;

imparting a bend to a first portion of said first optical fiber at a first predetermined location relative to said second optical fiber; and

selectively toggling said first optical fiber between said first predetermined spatial relationship with respect to a second optical fiber and a second predetermined spatial relationship with respect to a second optical fiber.

19. The method of claim 18 further comprising the steps of:

placing said first optical fiber in a first predetermined spatial relationship with a third optical fiber;

imparting a bend to a second portion of said first optical fiber at a second predetermined location relative to said third optical fiber; and

selectively toggling said first optical fiber between said first predetermined spatial relationship with respect to said third optical fiber and said second predetermined spatial relationship with respect to said third optical fiber.